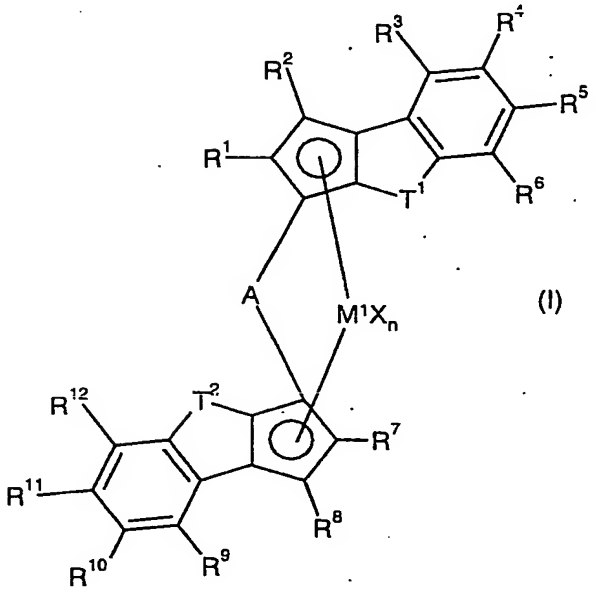
We claim

1. An organometallic transition metal compound of the formula (I)



(I)

where

M^1 is a metal of group 3, 4, 5 or 6 of the Periodic Table of the Elements or the lanthanides,

X are identical or different and are each an organic or inorganic radical, where two radicals X can also be joined to one another,

n is a natural number from 1 to 4,

T^1, T^2 are identical or different and are each a divalent group selected from the group consisting of -O-, -S-, -Se-, -Te-, $-N(R^{13})-$, $-P(R^{13})-$, $-As(R^{13})-$, $-Sb(R^{13})-$, $-Si(R^{13})_2-$, $-C(R^{13}R^{14})-C(R^{13}R^{15})-$ and $-C(R^{14})=C(R^{15})-$, where R^{13}, R^{14} and R^{15} are identical or different and are each hydrogen or an organic radical having from 1 to 40 carbon atoms,

R^1, R^7 are identical or different and are each hydrogen or an organic radical having from 1 to 40 carbon atoms,

R^2, R^8 are identical or different and are each hydrogen or an organic radical having from 1 to 40 carbon atoms,

R^3, R^9 are identical or different and are each halogen or an organic radical having from 1 to 40 carbon atoms, where R^3 is not methyl when T^1 is –C(H)=C(H)-,

R^4, R^5, R^6, R^{10}, R^{11} and R^{12} are identical or different and are each hydrogen, halogen or an organic radical having from 1 to 40 carbon atoms, or two adjacent radicals R^4, R^5, R^6, R^{10}, R^{11} and R^{12} together with the atoms connecting them form a monocyclic or polycyclic, substituted or unsubstituted ring system which has from 1 to 40 carbon atoms and may also contain heteroatoms selected from the group consisting of the elements O, S, Se, Te, N, P, As, Sb and Si,

or,

if T^1 or T^2 is -O-, -S-, -Se- or -Te-, the radical R^3 together with R^4 and/or the radical R^9 together with R^{10} forms a monocyclic or polycyclic, substituted or unsubstituted ring system which has from 1 to 40 carbon atoms and may also contain heteroatoms selected from the group consisting of the elements O, S, Se, Te, N, P, As, Sb and Si,

and

A is a bridge consisting of a divalent atom or a divalent group.

2. An organometallic transition metal compound of the formula (I) as claimed in claim 1,

wherein

M^1 is an element of group 4 of the Periodic Table of the Elements,

n is 2,

T^1, T^2 are identical and are each -O-, -S-, -Se- or -Te-,

R^1, R^7 are identical and are each a C_1-C_{10}-alkyl radical,

R^2, R^8 are identical and are each hydrogen,

R^3, R^9 are identical or different and are each a substituted or unsubstituted C_6-C_{40}-aryl radical or C_2-C_{40}-heteroaromatic radical containing at least one heteroatom selected from the group consisting of O, N, S and P,

R^4, R^5, R^{10} and R^{11} are identical and are each hydrogen,

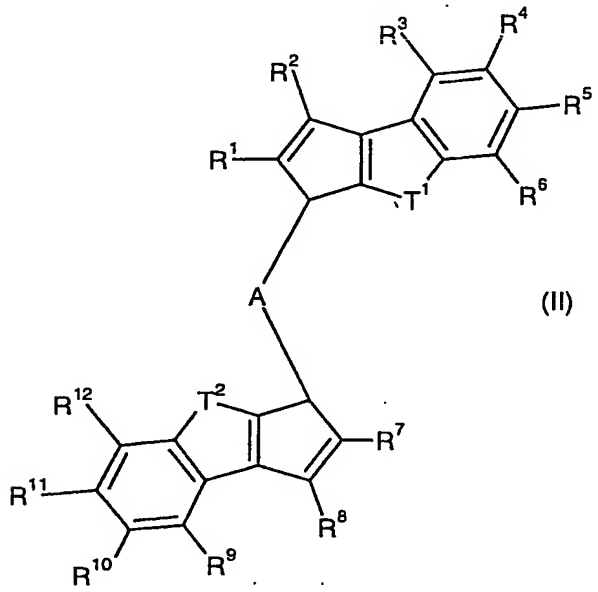
R^6, R^{12} are identical and are each hydrogen or an organic radical having from 1 to 20 carbon atoms,

A is a substituted silylene group or a substituted or unsubstituted ethylene group,

and

the other variables are as defined in claim 1.

3. A biscyclopentadienyl ligand system of the formula (II)



(II)

or one of its double bond isomers,

where the variables R^1, R^2, R^3, R^4, R^5 R^6, R^7, R^8, R^9, R^{10}, R^{11}, R^{12}, T^1, T^2 and A are as defined in formula (I).

4. A biscyclopentadienyl ligand system of the formula (II) as claimed in claim 3,

wherein

T^1, T^2 are identical and are each -O-, -S-, -Se- or -Te-,

R^1, R^7 are identical and are each a C_1-C_{10}-alkyl radical,

R^2, R^8 are identical and are each hydrogen,

R^3, R^9 are identical or different and are each a substituted or unsubstituted C_6-C_{40}-aryl radical or C_2-C_{40}-heteroaromatic radical containing at least one heteroatom selected from the group consisting of O, N, S and P,

R^4, R^5, R^{10} and R^{11} are identical and are each hydrogen,

R^6, R^{12} are identical and are each hydrogen or an organic radical having from 1 to 20 carbon atoms,

and

A is a substituted silylene group or a substituted or unsubstituted ethylene group.

5. A catalyst system for the polymerization of olefins comprising at least one organometallic transition metal compound as claimed in claim 1 or 2 and at least one cocatalyst which is able to convert the organometallic transition metal compound into a species which displays polymerization activity toward at least one olefin.

6. A catalyst system as claimed in claim 5 which further comprises a support.

7. A process for preparing polyolefins by polymerization or copolymerization of at least one olefin in the presence of a catalyst system as claimed in claim 5 or 6.

8. The use of a biscyclopentadienyl ligand system as claimed in claim 3 or 4 for preparing an organometallic transition metal compound.

9. A process for preparing an organometallic transition metal compound, which comprises reacting a biscyclopentadienyl ligand system as claimed in claim 3 or 4 or a bisanion prepared therefrom with a transition metal compound.

10. A polyolefin obtainable by the process as claimed in claim 7.